

Claims

- [c1] 1. A flexible imaging member seam treatment method comprising bonding a thermoplastic polymer film to the seam of the flexible imaging member after placing the film on the seam, bonding comprising heating the film above a glass transition temperature of at least one of a thermoplastic polymer from which the film is made and a polymer from which an imaging layer of the flexible imaging member is made.
- [c2] 2. The method of claim 1 wherein bonding further comprises applying pressure to the film.
- [c3] 3. The method of claim 2 wherein applying pressure comprises exerting a compressive pressure of between about 70 lbs/in² and about 770 lbs/in on the film and seam.
- [c4] 4. The method of claim 1 further comprising removing a substrate supporting the thermoplastic polymer film after bonding.
- [c5] 5. The method of claim 1 wherein bonding comprises blending the thermoplastic polymer film into the imaging layer.
- [c6] 6. The method of claim 5 wherein blending occurs as a result of providing a thermoplastic polymer film compatible with the polymer of the imaging layer.
- [c7] 7. A flexible imaging member seam treatment method comprising:
providing a treatment strip including a thermoplastic polymer layer;
placing the treatment strip over a seam of a photoreceptor belt with the thermoplastic polymer layer contacting the seam;
applying pressure and heat to the strip; and
removing the pressure and heat from the strip after sufficient time has passed for the thermoplastic polymer to bond to the seam.
- [c8] 8. The method of claim 7 wherein providing a treatment strip includes providing a thermoplastic polymer film on a substrate.
- [c9] 9. The method of claim 8 wherein providing a treatment strip further comprises

cutting the treatment strip from a thermoplastic-polymer-film-coated substrate.

- [c10] 10. The method of claim 8 wherein providing a treatment strip further comprises providing a high-temperature-resistant substrate.
- [c11] 11. The method of claim 10 wherein providing a treatment strip further comprises providing a flexible metallic film substrate.
- [c12] 12. The method of claim 10 wherein providing a treatment strip further comprises providing a high-glass-transition-temperature flexible polymeric film substrate.
- [c13] 13. The method of claim 12 wherein providing a high-glass-transition-temperature flexible polymeric film substrate comprises providing a biaxially-oriented PET film substrate.
- [c14] 14. The method of claim 7 wherein providing a thermoplastic polymer film comprises providing a charge transport compound.
- [c15] 15. The method of claim 14 wherein providing a thermoplastic polymer film further comprises including a polycarbonate compound.
- [c16] 16. The method of claim 15 wherein the polycarbonate compound includes Makrolon.
- [c17] 17. The method of claim 14 wherein providing a thermoplastic polymer film further comprises including a charge transport compound.
- [c18] 18. The method of claim 7 wherein the treatment strip comprises a substrate layer and the method further comprises removing the substrate layer after removing the pressure and heat from the strip.
- [c19] 19. The method of claim 7 where in applying pressure and heat includes providing a heated pressure element, heating the heated pressure element to a temperature sufficient to raise a temperature of the thermoplastic layer to a temperature falling within the range of from about 20 ° C to about 70 ° C above a glass transition temperature of at least one of an imaging layer of the

photoreceptor belt and the polymer of the strip.

[c20] 20. The method of claim 7 wherein the thermoplastic polymer layer comprises a thermoplastic polymer selected to form a polymer blend with a polymer from which an imaging layer flexible imaging member is made.

[c21] 21. The method of claim 7 wherein the thermoplastic polymer layer comprises chemical constituents that make up an imaging layer of the flexible imaging member.

[c22] 22. A flexible imaging member seam treatment method comprising:
placing a flexible imaging member seam region on a support surface;
placing a thermoplastic polymer film on the seam region; and
heating the thermoplastic polymer film to a temperature falling in the range of from about 20 ° C to about 70 ° C above a glass transition temperature of at least one of a thermoplastic polymer of the thermoplastic polymer film and a polymer of an imaging layer of the flexible imaging member.

[c23] 23. The method of claim 22 wherein placing a thermoplastic polymer film on the seam region further comprises forming a treatment article including the thermoplastic polymer film on a substrate and placing the treatment article on the seam region with the thermoplastic polymer film in contact with the seam region.

[c24] 24. The method of claim 23 wherein forming a treatment article further comprises providing a substrate comprising a high-temperature-resistant material.

[c25] 25. The method of claim 24 wherein providing a substrate comprising a high-temperature-resistant material includes providing a substrate comprising a flexible metallic film.

[c26] 26. The method of claim 24 wherein providing a substrate comprising a high-temperature-resistant material includes providing a substrate comprising a high-glass-transition-temperature flexible polymeric film.

[c27] 27. The method of claim 26 wherein providing a substrate comprising a high-

glass-transition-temperature flexible polymeric film comprises providing a biaxially-oriented PET film.

[c28] 28. The method of claim 22 wherein the thermoplastic polymer film comprises a thermoplastic polymer selected to form a polymer blend with a polymer from which the flexible imaging member is made.

[c29] 29. The method of claim 22 wherein heating the thermoplastic polymer film comprises directing infrared radiation at the thermoplastic polymer film.

[c30] 30. The method of claim 29 wherein heating the thermoplastic polymer film further comprises providing an infrared laser source from which the infrared radiation emanates.

[c31] 31. The method of claim 22 wherein heating the thermoplastic polymer film comprises applying a heated element to the thermoplastic polymer film.

[c32] 32. The method of claim 31 further comprising applying pressure to the thermoplastic polymer film with the heated element.

[c33] 33. The method of claim 31 wherein applying a heated element further comprises providing a heated bar.

[c34] 34. The method of claim 31 wherein applying a heated element further comprises providing a heated roller.

[c35] 35. An ultrasonically welded seamed flexible imaging member seam treatment process comprising:
providing an elongated support member having a smooth supporting surface;
providing a flexible belt having parallel edges and a welded seam extending from one edge to another edge, the belt seam including a seam region with an overlap and two adjacent splashings, the belt comprising a thermoplastic polymer material having a glass transition temperature, and inner and outer surfaces;
supporting the inner surface of the seam region on the smooth supporting surface with the seam region of the belt conforming to the supporting surface of the support member;

placing a thermoplastic polymer strip comprising a same material as a binder polymer of a top imaging layer directly of the seam region over the seam;
contacting the polymer strip above the seam with a heated surface comprising a smooth material with at least one of a low surface energy and an adhesive property with a profile that is substantially parallel to the smooth supporting surface;
heating the strip to a temperature of from about 20 ° C to about 70 ° C above a glass transition temperature of at least a lower of the thermoplastic polymer material and the top imaging layer; and
compressing the strip above the seam with the heated surface to effect at least one of overcoat lamination, protrusion reduction, surface profile smoothing, seam region physical continuity enhancement, and seam region thickness reduction.